

Converging Technology

The Aviation Green Prize

By Brien A. Seeley M.D., President
Comparative Aircraft Flight Efficiency
(CAFE) Foundation
A 501c3 non-profit organization

who you choose as mates will ultimately

81: CAFE Foundation founded as 501(c)

81-1990: CAFE 400 flight efficiency race

92-2003: CAFE and EAA APR Program

04-Present: CAFE and NASA Centennial

07 PAV Challenge & Founded First Ever

08 GAT Challenge & EAS II and AGP g

Require Multiple Advances in Green

Motivate Teams and Specta

Fairness and Accuracy

Relevant to the Masses

(Someday, I could own one!)

Showcase that rewards Innov

US \$1.65 Million

Summer 2011

A NASA-funded flight comp
our the development of ultra

Score = $1 / ((1/\text{mph}) + 2/(\text{seats}))$

Requires 200 Passenger MPGe and 100 mph stall

100 foot takeoff distance over 50' obstacle

100 statute mile range

Realistic seating & payload

A license



Minimize weight

Minimize drag

Make each person
do many jobs

Just enough

Ideal material

D and 3D mapping

h-tech composites

c mills

OTS automotive parts

FE's PAV library of research

FE consultants

iversity faculty: Form your teams!!











Electronic Certificated Flight Instructor”

Make PAVs easy to fly

Synthetic vision with HITS

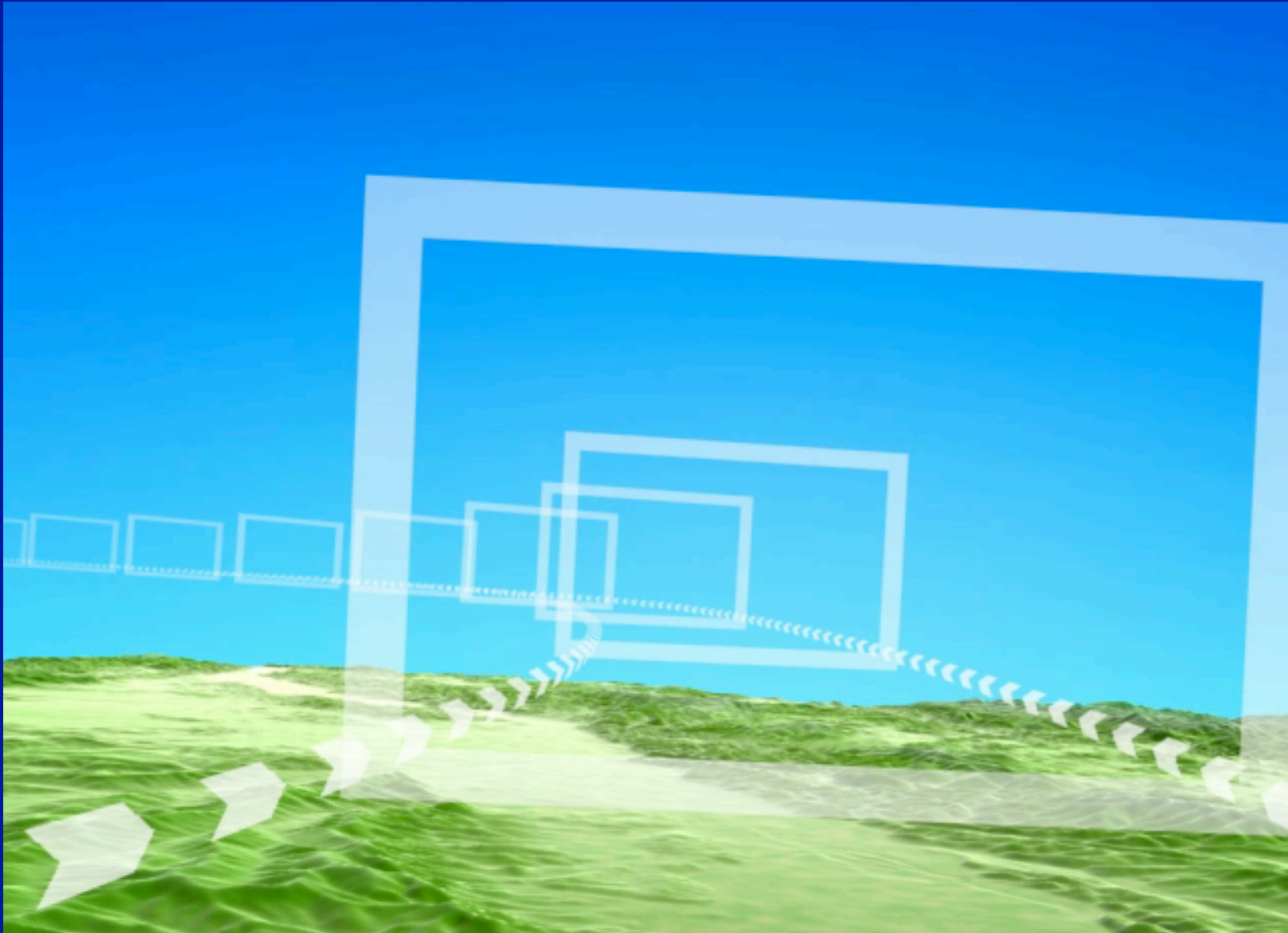
Generic controls and displays

Single power lever

Optic Controls

Simplified training





to Simplify Pilot Training To Rival DMV

Automated Diagnostics—Aircraft preflights itself

voice alerts, CFIT, Traffic Avoidance

Electronic Stall Proofing or “ESP”

voice recognition commands by pilot

Automatic power setting and propulsion monitoring

Command Usurp Command by Smart Auto-pilot

Sensor Technology, Digital Gyros, GPS, ADS-B

Autonomous Flight—if human incapacitated

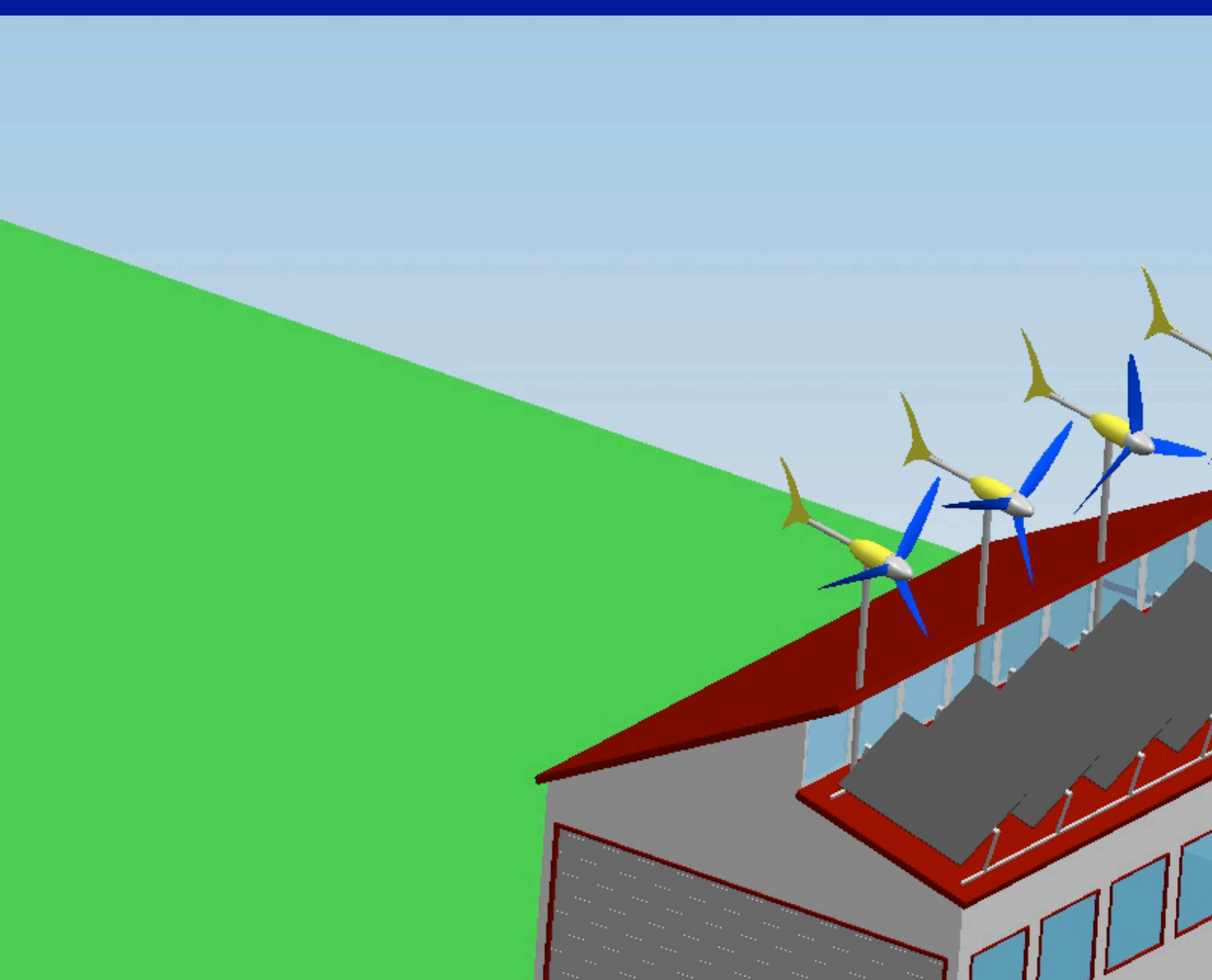
Automatic Takeoff: difficult, power & wind management

gear retract, over-ride design

Landing: The Big Hurdle. Needs radar altimeter and

Essential Ingredient for Aviation'







$A_d = 0.76 \text{ sq ft}$



Team Experts in:

Noise Reduction

STOL

Drag reduction

Propellers

Engine/Motor(s)

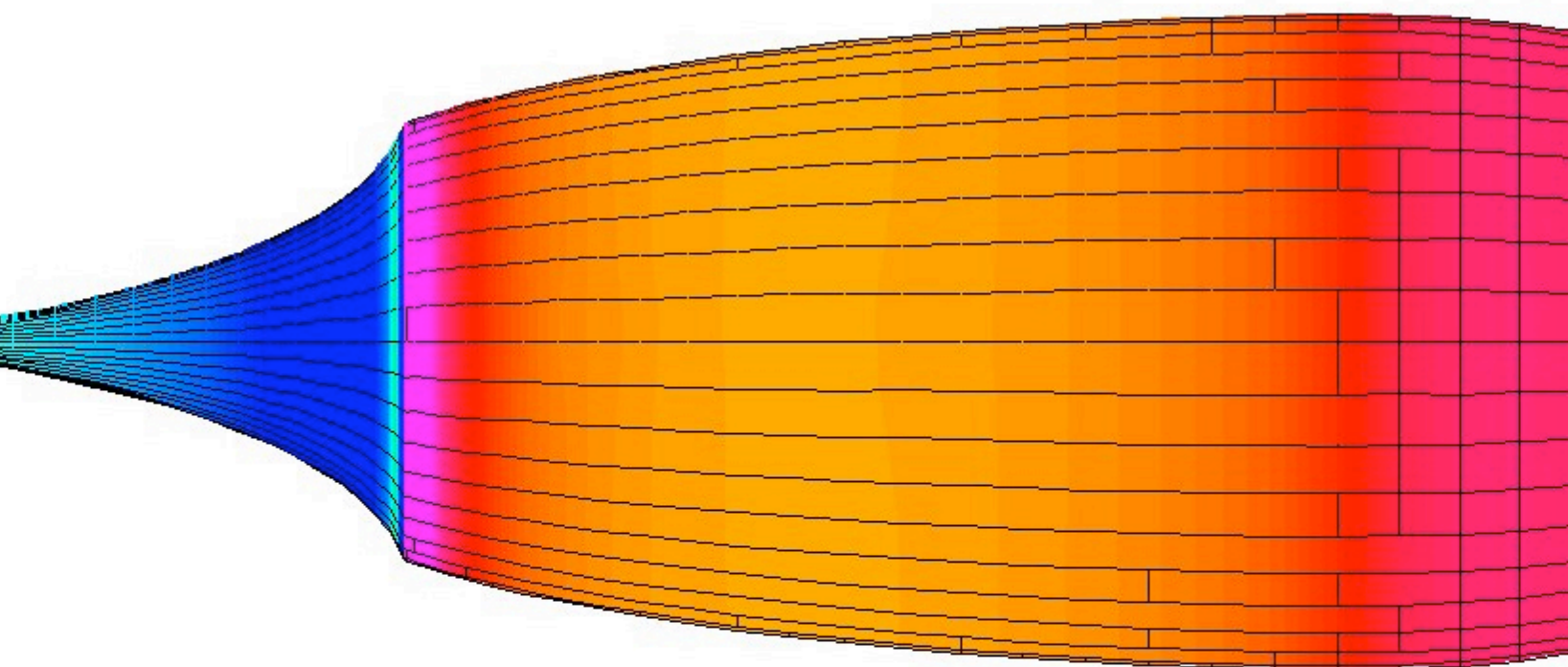
Structures

High Aspect Ratio
laminar flow
laminar people pod
moderate glide ratio
low BHP required
it still go fast (Ad)



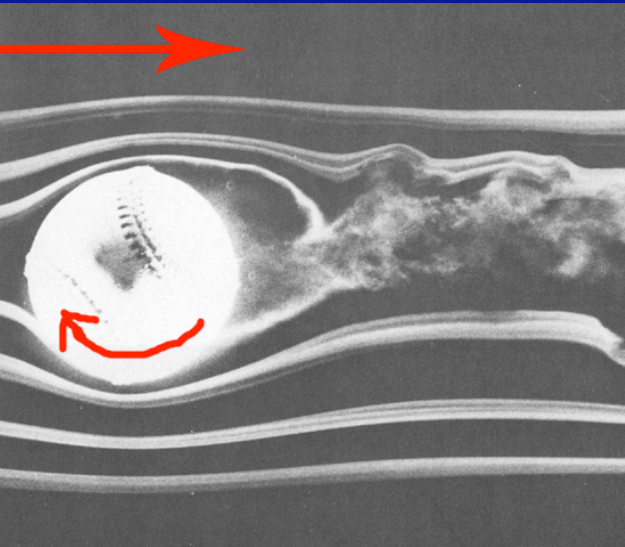
$C_{Do} = .0012$ at $q = 20$ and $Re =$





High Pressure

Neutral Pressure





High-lift
decid



Walk to tow



If three or more seats, two must be side



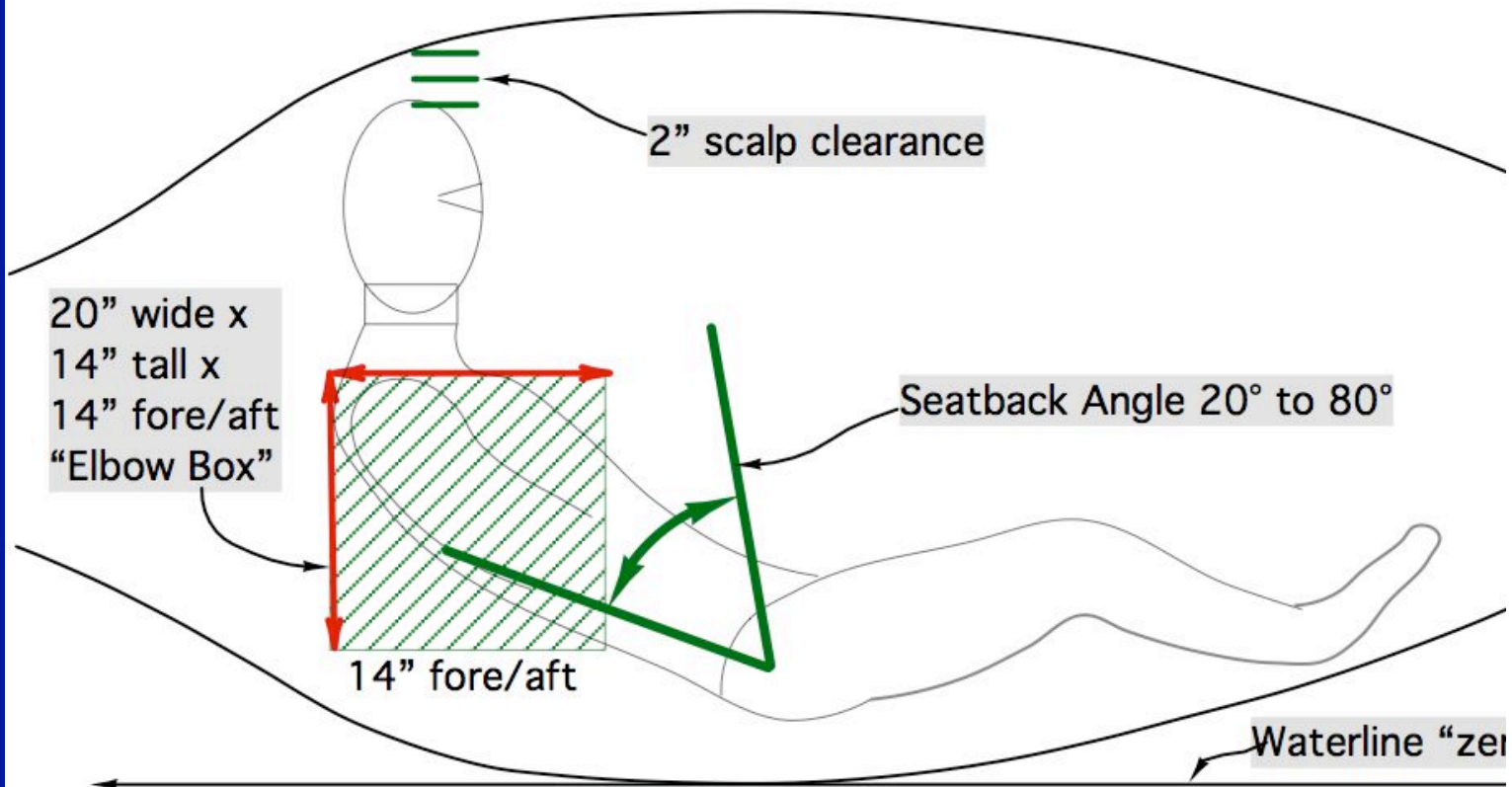


Great FOV
Laminar?



CAFE AVIATION GREEN PRIZE

Minimum Seat Dimensions and Volume



Minimum Dimensions For Each Seat:



ar cell power generation is free to AGP

W/sq.m. Or about 1.3 HP/sq.m. (noon

00 per watt versus \$0.20 per KW-hr

ar Cell Efficiency:

8% for Copper indium diselenide cells

8% for Cadmium Telluride cells

% for amorphous-Si cells

BHP bio-diesel from GSE

erates 10 KW

lb engine/generator + 150

uel: Range extender

bsfc at constant

ver > 1 gph

f-sufficiency on-board



ould the AGP be an annual event?

ould the Prize money grow larger?

ould it be given for STOL?

ould it be given for lowest noise?

ould it be given for maximum range?

Same rules in 2012, BU

Fly 200 miles

Land and “recharge” in less than
(solar panels)

Immediately fly another 200 m

The Aviation Green Prize Challenge

A crucible for combining Greentech and aviation

A rallying point for university teams

A global showcase that celebrates excellence

New, 'must have' vehicles

A thrilling, suspenseful race

The 'Super Bowl' of Green

Please send your comments

www.cafefoundation.org